

Appl. No. 09/135,180
Amdt. Dated May 24, 2004
Reply to Office Action of March 11, 2004

Attorney Docket No. 5586D-6845 (81784.0179)
Customer No.: 26021

REMARKS/ARGUMENTS

Claims 1-4 are pending in the application. By this amendment, claim 1 is being amended to improve its form. No new matter is involved.

In paragraph 3 on page 5 of the Office Action, claims 1-3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,121,192 of Kazui in view of U.S. Patent 5,668,597 of Parulski et al., and further in view of U.S. Re. 36,812 of Tani. In paragraph 4 on page 7 of the Office Action, claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kazui '192 in view of Parulski et al. '597 and Tani '812, and further in view of U.S. Patent 6,288,744 of Takahashi. These rejections are again respectfully traversed.

As previously pointed out in Applicant's prior responses, in accordance with the present invention, in a first image pickup operation, the first set of light-receiving elements in the image pickup section accumulates electric charges in accordance with incident light, while the second set of light receiving elements in the image pickup section does not accumulate electric charges. In this manner, a thinned-out image signal can be obtained before performing frame transfer to the storage section. In contrast, the image signal in Parulski is not thinned-out before performing frame transfer to the storage section. Electric charges corresponding to several lines are eliminated by the fast dump structure 62 at the performing frame transfer to the storage section.

Therefore, structures in accordance with the invention are substantially different from those of Parulski. Parulski does not disclose or suggest a structure wherein electric charges are eliminated directly from picture elements.

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Regarding Takahashi, Applicant has previously pointed out that such reference provides a difference in impurity concentrations between vertical and horizontal transfer channels.

As also previously pointed out by Applicant, Tani teaches that unnecessary charges accumulated in the device are discharged into the substrate. However, such reference does not disclose or suggest that all of the accumulated charges are discharged. Moreover, such reference does not disclose or suggest that charges are discarded by controlling voltages supplied to transfer electrodes.

In rejecting the claims on the references cited, the Office Action states in paragraph 1 on page 2 thereof that the features upon which Applicant relies are not recited in the claims. More specifically, it is stated that the claims do not recite "a thinned-out image signal can be obtained before performing frame transfer to the storage section", nor do they recite "charges are discarded by controlling voltages to transfer electrodes". In response to these assertions, Applicant respectfully points out that the claims recite combinations in which these functions are clearly obtained.

However, in order to make it explicit that such features are recited in the claims, Applicant is amending claim 1 to further recite "wherein a thinned-out image signal can be obtained before performing frame transfer to the storage section". Claim 1 is being further amended to recite "wherein charges are discarded by controlling voltages to transfer electrodes". As so amended, it should be clear that claim 1 clearly distinguishes patentably over the attempted combination of references. Claims 2-4 depend from and contain all of the limitations of claim 1 so as to also distinguish patentably over the art.

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As described in claim 1, the first image pickup operation, the electric charges generated in the second set of light receiving elements are directly discharged from the second set of light receiving elements because all of the corresponding transfer electrodes of the second set of light receiving elements are inactivated. In accordance with this feature, charges accumulated in the second set of light receiving elements are discarded by controlling voltages to transfer electrodes and a thinned-out image signal is obtained before performing frame transfer to the storage section (i.e., in the first image pickup operation). Again, and as discussed above, claim 1 further specifically recites "wherein a thinned-out image signal can be obtained before performing frame transfer to the storage section in the first image pickup operation", and "wherein charges are discarded by controlling voltages to transfer electrodes". The various references, taken alone or in the attempted combinations thereof, do not disclose or even suggest such features in accordance with the invention. Again, claims 1-4 are submitted to clearly distinguish patentably over the cited references.

Entry of this amendment under the provisions of 37 C.F.R. § 1.116 as placing the application in condition for allowance or alternatively in better form for appeal, and reconsideration and allowance in view thereof, are respectfully requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles telephone number (213) 337-6846 to discuss the steps necessary for placing the application in condition for allowance.

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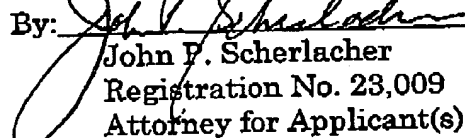
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Respectfully submitted,

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Date: May 24, 2004

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